Public Workshop for Proposed Amendments to Rule 1110.2, and Proposed Rescinding of Rule 1110.1

February 1, 2005
South Coast Air Quality Management District

Overview of Goals

- Rescind Rule 1110.1
  - Completely superceded by Rule 1110.2
- Amendments to Rule 1110.2:
  - Comply with SB700 by removing the exemption for agricultural engines
  - Improve the monitoring, recordkeeping and reporting for better compliance
  - Simplify stationary and portable engine requirements
  - Minor changes to stationary engine limits
  - Limit portable generators to emergency use

SB 700

- Finds agricultural operations are a significant source of air emissions
- Requires AQMD to require Best Available Retrofit Control Technology for agricultural engines

Engine Compliance Problems

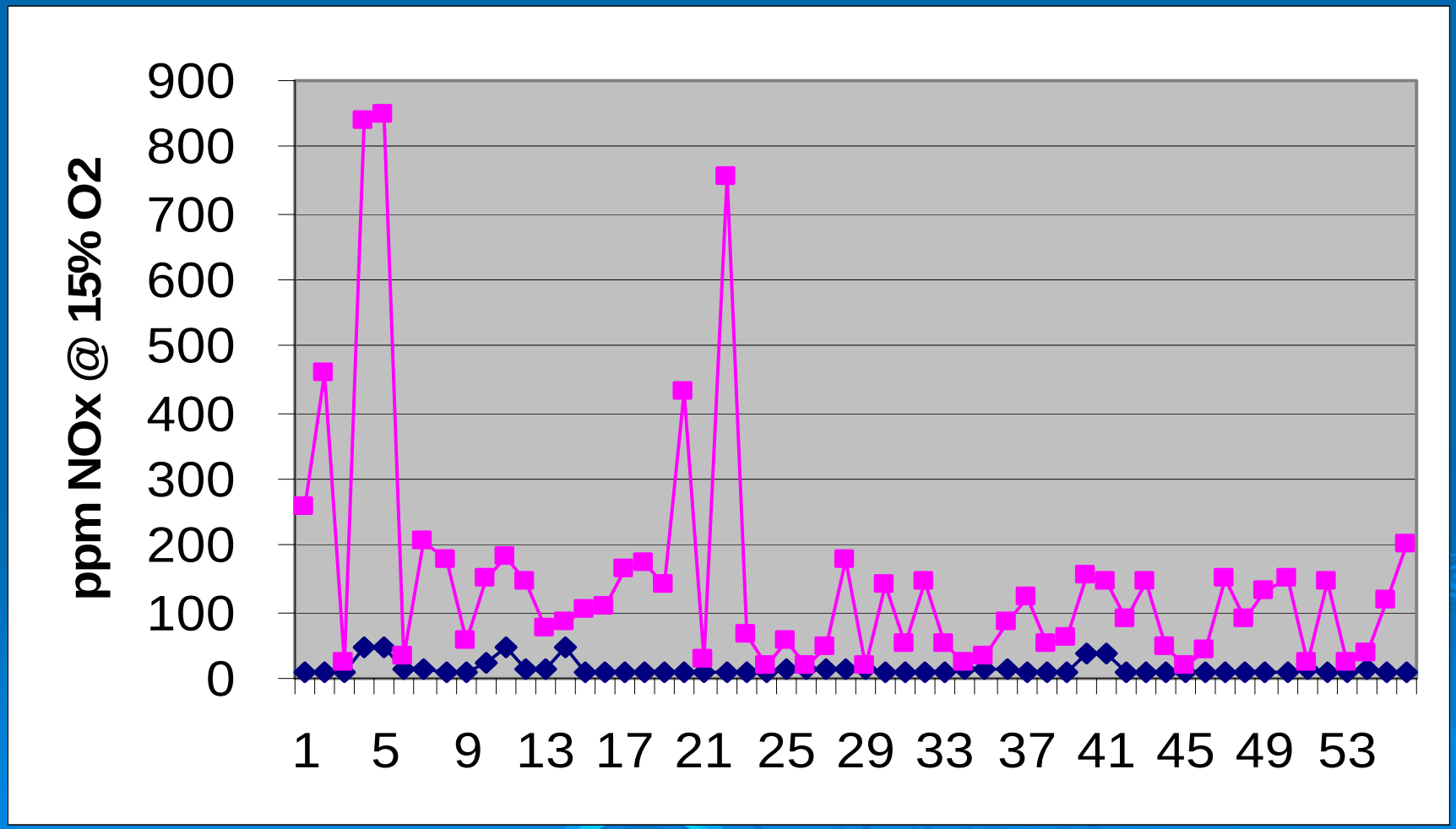
- Unannounced emission tests of engines by AQMD
- 127 tests of old engines subject to Rule 1110.2 and new engines subject to more stringent BACT
- Engines driving compressors, pumps and electrical generators
- Engines by nine engine manufacturers or packagers

Recent AQMD Compliance Testing of I.C. engine

	NOx	CO
% Non-Compliance with Permit Limits	63.8%	
Rule 1110.2 Limits, ppm*	36-45	2000
Average ppm*	72	732
Maximum ppm*	850	12,500

* All dry, by volume, and corrected to 15% O2

Tested NOx versus Permit Limit for Non-Compliant Engines



Nonroad and Portable Engines

- USEPA regulates new nonroad engines
- Portable engines are a subset of nonroad engines
- CARB can regulate nonroad engines if authorized by USEPA
- Local districts may regulate use of nonroad engines, such as operating hour restrictions, and fuel specifications

Affected Sources and Emission Inventory – Ag Sources

Engine Class	Average HP	Engines	Annual Emissions (Tons/Year)			
			NOx	VOC	CO	PM
Irrigation Pumps						
Stationary	120	8	11.7	2.5	1.6	.81
Portable	137	5	2.1	0.5	0.2	0.15
Well/Water Pumps						
Stationary	173	18	56.1	7.2	43.6	2.37
Portable	95	4	2.59	0.56	0.21	0.19
TOTAL		**35**	**73.3**	**10.7**	**45.6**	**3.5**

Affected Sources and Emission Inventory – Ag Sources

- 26 Stationary Engines
  - 10 natural gas
  - 16 diesel
- 16 Ag Facilities

Affected Sources and Emission Inventory – Other Stationary Engines

1990 Rule 1110.2 Adoption Estimates

- 1289 stationary non-emergency engines
- Pre-Rule 1110.2 Emissions:
  28.0 tons NOx/day
- Post-Rule 1110.2 Emissions:
  2.9 tons NOx/day

Affected Sources and Emission Inventory – Other Stationary Engines

Current Estimates:

	No. of Facilities	No. of Engines
RECLAIM	35	135
Non-RECLAIM	420	855
Total	455	990

Agricultural Sources Incentives

- $4 million of incentive funding for ag sources in AQMD will be available starting in 2006
- Up to $13,600 per ton for NOx, VOC and PM
- Allowed even for emission reductions required by rules
- Could pay for all upfront capital costs

Southern California Edison TOU-PA-ICE Rate Proposal

- Proposed to CPUC on 11/9/2004 for electrification of engine pumps (except natural gas)
- Electric rates range from 4.5 to 9.9 cents/kW-hr ($0.63-$1.37 per diesel gallon equivalent)
- Average is 5.9 cents/kW-hr ($0.83/gal)
- Additional line extension funding, up to $30,000 for a 150 hp engine

Proposed Amendments - Exemptions

- Replace ag engine exemption with exemption for orchard wind machines (81 per survey)
- Change emergency engine exemption from <200 hours/year to 200 hours or less (229 emergency ag engines per survey)
- Change area names for the attainment area exemption
- Minor change to state-registered portable engines
- Deleted nonroad exemption

Proposed Amendments to Requirements – Electrification Alternative

- Replace gram/bhp-hr limits with concentration limits for stationary engines not removed per initial compliance plan
- Based on 30% HHV efficiency

NO_x (ppm)1	VOC (ppm)1, 2	CO (ppm)1
11	30	70

[1] Corrected to 15% O_2, dry basis, 15-min. avg.
[2] Measured as carbon.

Proposed Amendments to Requirements – Efficiency Correction

- Eliminate efficiency correction because it is difficult to determine, and often ignored.
- Unnecessary for three-way catalyst equipped engines (CARB BARCT is 25 ppm without efficiency correction)
- Staff seeks input on lean-burn and biogas engines

Proposed Amendments to Requirements – VOC Limit Reduction

- Reduce VOC limit from 250 ppm to 100 ppm, effective 2007.
- USEPA uncontrolled emission factors are < 100 ppm
- No change required for rich-burn engines with three-way catalyst
- Staff seeks input, particularly for lean burn and biogas engines

Proposed Amendments to Requirements – Portable Engines

- Federal preemption
- Proposed Amendments:
  - Delete current emission limits
  - Limit use of portable engine generators to emergency use only (CARB has same requirement for statewide portable equipment registration)

Proposed Amendments to Compliance Subdivision

- Removal of obsolete compliance dates
- Ag Engine Compliance Schedule:

  Existing Engines

  - Jan 1, 2006: Submit applications
  - Sept 30, 2006: Start construction
  - Jan 1, 2007: Complete source testing and be in compliance.

  New Engines

  - Upon installation

Proposed Amendments to Compliance Subdivision

- I&M Plan Compliance Schedule:
  - Jan 1, 2006: Submit plan applications
  - May 1, 2006: Implement I&M Plan

Proposed Amendments to Monitoring, Recordkeeping and Reporting

- Alternative Continuous Emission Monitoring
  - Revise to allow approval based on "District Alternative Continuous Emissions Monitoring System Performance Specification and Guidelines"

Proposed Amendments to Monitoring, Recordkeeping and Reporting

- Continuous Emission Monitoring
  - Put CO CEMS requirement back in rule (deleted by 1997 rule)
  - Require CEMS for facilities with a combined rating of 500 hp or more
    - Time-sharing allowed for additional CEMS
  - Compliance with Rule 218
  - Require by 2007

Proposed Amendments to Monitoring, Recordkeeping and Reporting

- Source Testing
  - Go back to annual source testing (reduced to triannual by 1997 rule)
  - Accept relative accuracy tests of CEMS in lieu of NOx and CO source test
  - Require by 2007
- Reforms
  - 15 min at peak load and 30 minutes of normal operation

Proposed Amendments to Monitoring, Recordkeeping and Reporting

- Reforms (cont.)
  - No pretests
  - At least 250 hrs or 1 month since tuning or service
  - AQMD approved source test protocol
  - No aborting a test showing noncompliance
  - Submittal of test to AQMD within 14 days

Proposed Amendments to Monitoring, Recordkeeping and Reporting

- Inspection and Maintenance Plan (required by CARB BARCT)
  - Required for engines with no CEMS
  - Continuous monitoring and recording of engine and control equipment parameter monitoring
  - Weekly inspections of data

Proposed Amendments to Monitoring, Recordkeeping and Reporting

- I&M Plan (cont.)
  - Emission control diagnostic system and malfunction indicator light consistent with 40 CFR 1048.110 for non-road, spark-ignited engines
  - Weekly portable analyzer emission check per Draft Protocol
  - Preventative and corrective maintenance and schedules

Proposed Amendments to Monitoring, Recordkeeping and Reporting

- I&M Plan (cont.)
  - Reporting of non-compliance
    - Rule 430 protection if breakdown
  - Recordkeeping of monitoring data and actions required by I&M Plan
  - Plan revision procedure: submittal for approval to AQMD
  - Portable Analyzer Training Program

Proposed Amendments to Monitoring, Recordkeeping and Reporting

- Monitoring for a Rich-Burn (RB) Engine with 3-Way Catalyst (TWC)
  - Air/fuel ratio controller with O2 sensor
  - Monitoring of:
    - Engine load
    - Oxygen sensor voltage output
    - Catalyst inlet and outlet temperature
    - Catalyst differential static pressure.

Proposed Amendments to Monitoring, Recordkeeping and Reporting

- Monitoring of RB Engine with TWC
  - Weekly emission check; and
  - Monthly, or whenever an oxygen sensor is replaced, use of portable analyzer to verify or reestablish the acceptable range of the oxygen sensor at minimum, midpoint and maximum load

Proposed Amendments to Monitoring, Recordkeeping and Reporting

- Recordkeeping
  - Current rule only requires CEMS recordkeeping
  - Proposed recordkeeping of data, logs, test reports and other information required by the rule
  - Records to be kept 5 years

Proposed Amendments to Definitions

- Agricultural Stationary Engine

  AGRICULTURAL STATIONARY ENGINE is a non-portable engine directly used for the growing and harvesting of crops or the raising of fowl or animals for the primary purpose of making a profit, providing a livelihood, or conducting agricultural research or instruction by an educational institution. An engine used for the processing or distribution of crops or fowl or animals is not an agricultural engine (Ref. CARB stationary diesel ATCM)

Proposed Amendments to Definitions

- Minor change to Approved Emission Control Plan
- "Facility" Made consistent with definition in New Source Review Rule 1302
- Stationary Engine

  …….. an engine which is either attached to a foundation or if not so attached, does not meet the definition of a portable engine.

Proposed Amendments to Definitions

- VOC references Rule 102 definition
- Deleted unneeded definitions

Other Proposed Amendments

- Test Methods
  - Minor clarifications
- Technology Assessment for $PM_{2.5}$
  - Deleted because it was completed

Diesel Ag Engine Cost-Effectiveness

- Electrification
  - Typical cost savings of $9,500 per year
  - No AQMD permits, source testing or engine maintenance
- Repowered by Controlled Spark-Ignited Engine

Diesel Engine Type	$/ton	$/ton with incentive
Pre-1996	$4,300	$2,800
Tier 1	$9,100	$6,000
Tier 2	$15,600	$10,200

Natural Gas Engine Cost-Effectiveness

- Electrification

Engine Type	$/ton	$/ton w/incentive
Uncontrolled	$7,600	$4,100
Tier 1 (3.0 grams/bhp-hr NOx + HC)	$22,000	$11,900

- Adding a Three-way Catalyst and Air/Fuel Ratio Controller

Engine Type	$/ton	$/ton w/incentive
Uncontrolled	$6,500	$4,800
Tier 1	$22,900	$17,000

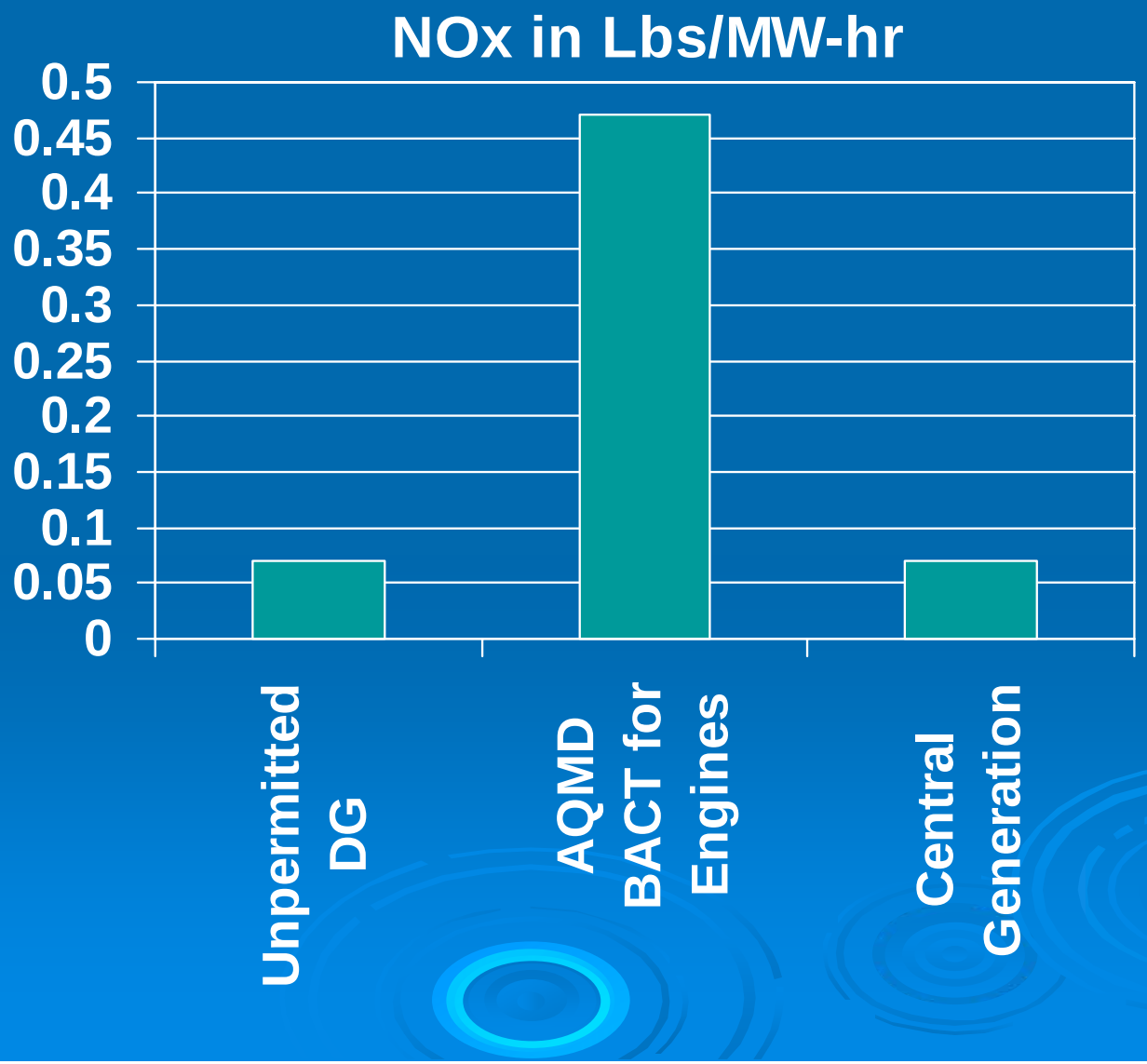
Cost-Effectiveness Comparison

- State law (H&SC 40724) requires a comparison of the rule's cost-effectiveness to the list of available control measures in the Air Quality Management Plan
- See Handout, listing 34 measures whose cost-effectiveness ranges from $400 to $20,000 per ton
- Compliance with Rule 1110.2 for ag engines compares very favorably to these measures

Distributed Generation

- Will propose emission standards for new DG equivalent to new large central generating stations
- Consistent with CARB 2007 DG standards for DG exempt from AQMD permits
- Phase 2 Rule 1110.2 Amendment

Emission Comparison



CARB 2007 DG Standards

	lb/MW-hr	Equivalent ppm @ 15% O2***
NOx	.07*	1.6-4.0
CO	0.1*	3.7-9.3
VOC	.02*	1.3-3.2
PM	Clean Fuel**	

*CHP credit of 1 MW-hr per 3.4 MMBtu of waste heat recovered

** Natural gas or equiv *** HHV efficiency: 28%-70%

Process and Schedule

- Written comments due Feb 10
- Public Board hearing on June 3, 2005 for ag engine amendments
- Another public workshop in April 2005 for other amendments
- Public Board hearing later in 2005 for other amendments